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December 23, 1993

Mr. William F. Caton
Acting Secretary
Federal Communications Commission
Room 222 - Stop Code 1170
1919 M St., N.W.
Washington, D.C. 20554

Re: Ex Parte Presentation - PR Docket No. 93-61

Dear Mr. Caton:

Transmitted herewith at the request of the FCC staff are product sheets detailing the standard antennas made available by Amtech for 902 - 928 MHz automatic vehicle monitoring systems. Additionally, custom antennas can be fabricated to meet customer supplied requirements and antennas designed initially for other communications uses can be employed if necessary in particular applications. The antennas used in actual installations are directional. The only nondirectional antennas are indoor whips operated for diagnostic and demonstration purposes. These are low power desktop applications in which tags that have been programmed are checked to verify the programmed code number. Such testing is normally conducted indoors with the power attenuated to limit the reading range to one foot. A similar restricted range low powered desktop unit is operated indoors for the purpose of demonstrating the concepts employed in Amtech system.

Amtech also has developed an antenna for use by railroads in high speed parallel track environments where safety concerns dictate that no structures above a very low height be placed near the tracks. See Amtech Comments in PR Docket No. 93-61 at 17, n. 33 (June 29, 1993). A product specification sheet for that product has not been published. The antenna is designed to be placed on the ground between two parallel tracks but as a directional antenna is used to read tags on cars on only one track. The tags on the car are approximately 6 feet above rail height. This antenna consists of a series of half wavelength patches spaced about a half wavelength apart. The overall length of the antenna is about 10 feet; it is about 4 inches wide and is constructed on a printed circuit board protected by a square shaped plastic tube. This antenna is mounted horizontally (i.e. on its side) about a foot above ground level in the

depression between the two sets of tracks. Sometimes, a second antenna is placed behind and slightly above the first antenna in order to produce a phased array that creates a null in the vicinity of the railcar wheels so as to reduce reflected energy from the wheels. Additionally, it should be noted that the antenna is radiating only when a train is passing.

The Amtech system employs either horizontal or vertical polarization depending on the application. Highway systems, including those used for automated toll collection, use horizontal polarization as do rail applications. Inter-modal tags are vertically polarized.

Should any question arise concerning this matter, please contact me.

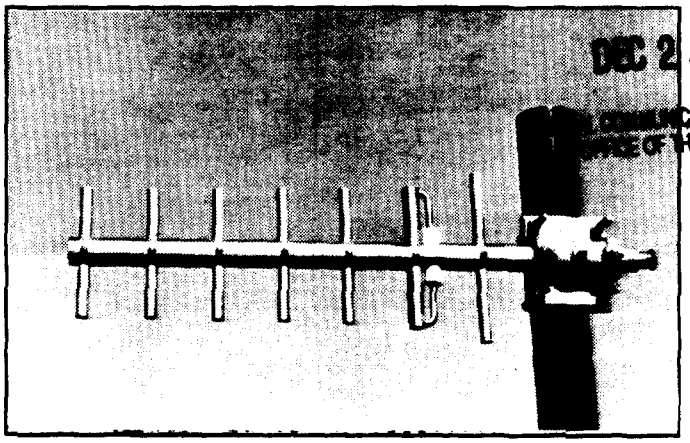
Respectfully,

David E. Hilliard

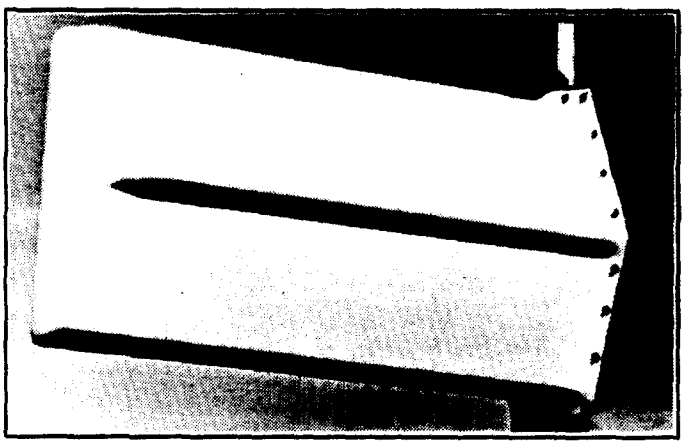
David E. Hilliard
Counsel for Amtech Corporation

cc: Mr. Steve Sharkey, Private Radio Bureau

AA3100 and AA3101 Yagi Antennas



AA3100 Yagi Antenna (mounted for vertical polarization).



AA3101 Yagi Antenna with Weatherproof Radome (mounted for vertical polarization).

Specifications

Frequency Range	902-928 MHz*
Size (AA3100)	18 x 60 cm 7 x 23 in
Size (AA3101)	36 x 50 x 77 cm 14 x 19.5 x 29 in
Weight (AA3100)	1.5 kg (3.25 lb)
Weight (AA3101)	10 kg (22.0 lb)
Gain (over dipole)	10 dB
VSWR	1.5:1 Max (1.33:1 Typical)
Impedance	50 ohms
Front-to-Back Ratio	>20 dB
Half-Power Beamwidth	40° E-Plane 48° H-Plane
Connector	Type N Female
Mounting	To circular support with maximum O.D. of 2.375 in (6 cm)

**Custom frequencies also available.*

Function

The AA3100 and AA3101 Yagi Antennas are used to broadcast and receive RF signals in the 902-928 MHz radio frequency band.

Features (AA3100)

Ruggedized Design. The AA3100 Antenna is fabricated of aluminum rod and seamless drawn pipe. All aluminum materials are gold anodized for maximum reliability and corrosion resistance. Hardware and fastenings are stainless steel.

The internal balun, coaxial feed and connectors are sealed in a foam potting system to prevent moisture penetration and assure long life in severe environmental conditions.

Mounting Versatility. The AA3100 Yagi's heavy tenzalloy mounting casting allows installation for vertical or horizontal polarization.

Symmetrical Pattern. For installations requiring a relatively symmetrical, three-dimensional reading area, the AA3100 offers a broadcast pattern of similar configuration and dimension in both the horizontal and vertical planes.

Features (AA3101)

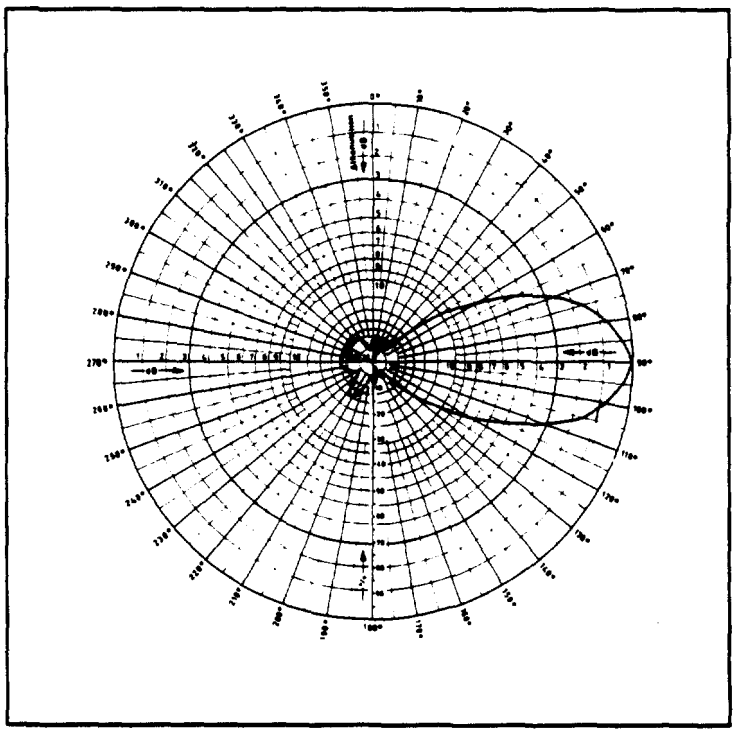
Weatherproof Enclosure. Identical in function and construction to the AA3100, the AA3101 is enclosed in a weatherproof radome, providing added protection from harsh environmental conditions.

The AA3101 contains the AA3100 Yagi Antenna, mounted on a heavy anodized aluminum backplate.

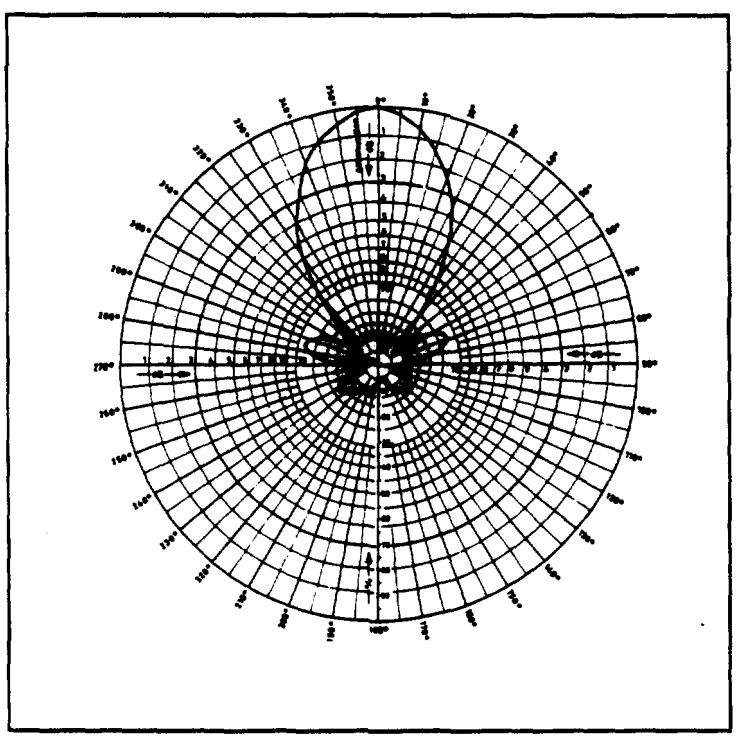
The outer surface of the radome has a slick white gel coat over a special laminated material of polyester resins selected for favorable electrical characteristics and high resistance to ultraviolet radiation.

AA3100 and AA3101 Yagi Antennas

Radiation Patterns



Vertical Plane Pattern (vertical polarization).



Horizontal Plane Pattern (vertical polarization).

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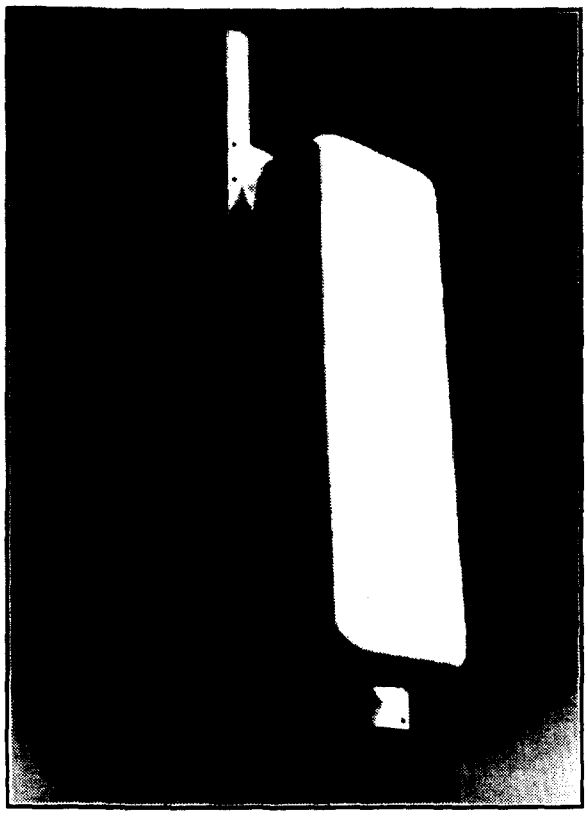


AA3110 Parapanel Antenna (mounted for horizontal polarization).

AA3110 Parapanel Antenna

Specifications

Frequency Range	902 to 928 MHz*
Size	73.3 x 26.7x 17.8 cm 29 x 10.5 x 7 in
Weight	4.1 kg (9.0 lb)
Gain (over dipole)	9.5 dB
VSWR	1.1:1 Maximum
Impedance	50 ohms
Front-to-Back Ratio	20 dB
Half-Power Beamwidth	75° E-Plane 24° H-Plane
Connector	Type N Female
Mounting	To circular support with maximum O.D. of 2.375 in (6 cm)

** Custom frequencies also available.*

Function

The AA3110 parapanel antenna is a precision dipole array designed for directional transmission and reception of RF signals in the 902-928 MHz radio frequency band.

Features

Quality Construction. The AA3110 parapanel includes a heavy aluminum backplate with mounting hardware, a multi-dipole array and matching system.

Weatherproof Enclosure. The parapanel antenna is enclosed in a heavy laminated fiberglass radome (with "screws tight") for protection against severe environmental conditions. Holes to accommodate the AT5720 check tag and T&B hood mounting accessories are drilled, tapped, and plugged.

UV Tolerant. Radome materials are carefully selected for favorable electrical characteristics and resistance to ultraviolet radiation.

Corrosion Resistant. All fastenings and hardware are constructed of stainless steel for maximum corrosion resistance.

Low Profile. The AA3110 parapanel's relatively narrow (7 inch/17.8 cm) depth makes it ideally suited to applications requiring a low-profile antenna.

Asymmetrical Pattern. For installations requiring a reading area larger in one dimension than in another, the AA3110 parapanel provides a 49° variance in half-power beamwidth from the horizontal to the vertical plane.

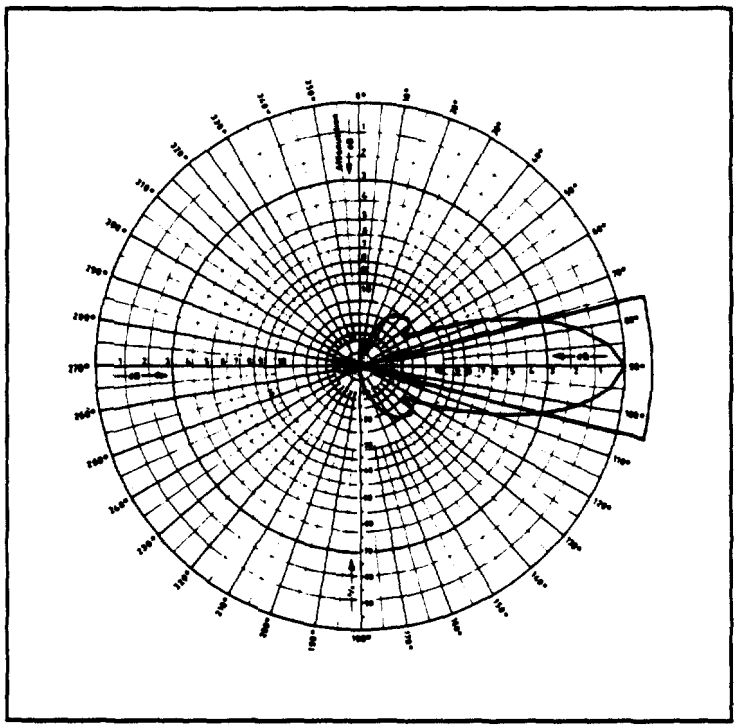
Options

Check Tag Option. The AA3110 parapanel may be ordered with the AT5720 check tag installed.

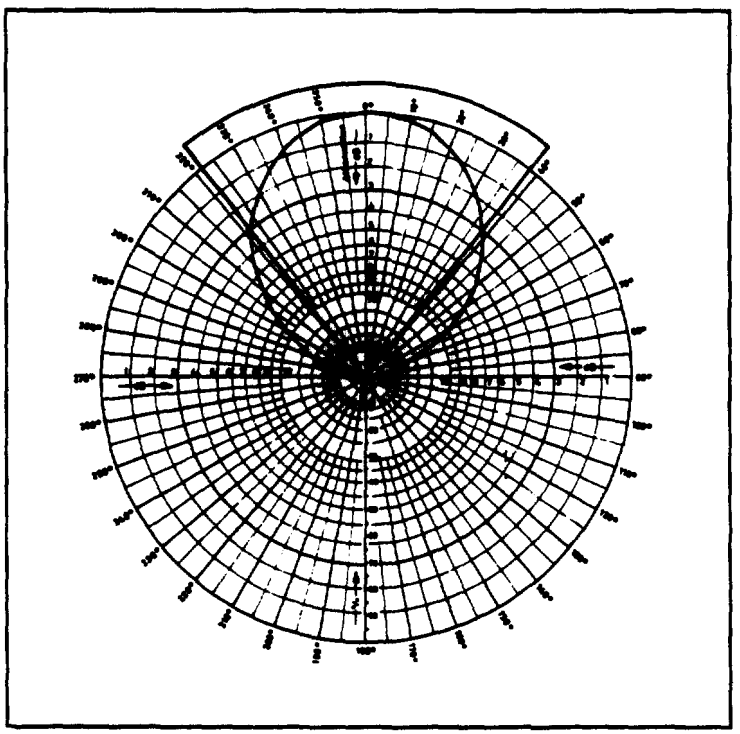
Hood Option. The parapanel is available with T&B industrial connectors, including hood and base with gasket. Please specify straight or right-angle hood.

AA3110 Parapanel Antenna

Radiation Patterns



Vertical Plane Pattern (horizontal polarization).



Horizontal Plane Pattern (horizontal polarization).

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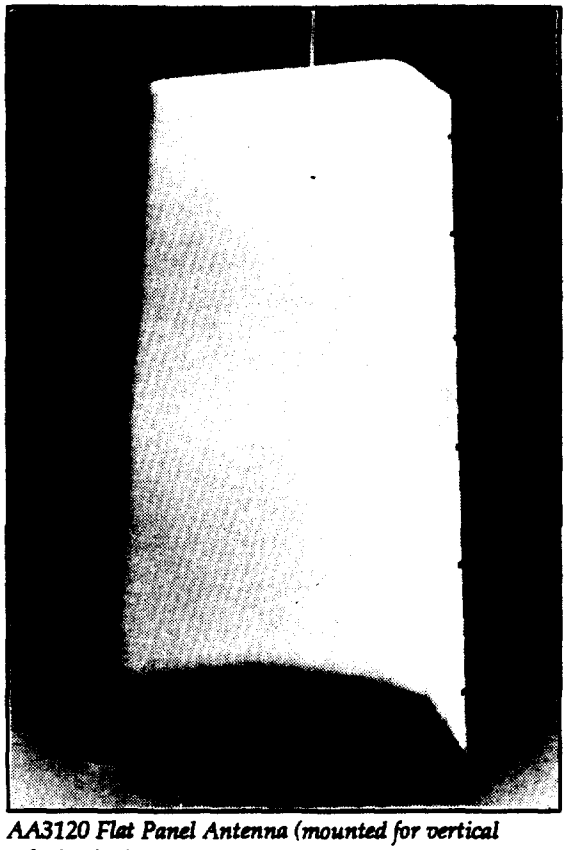


AA3120 Flat Panel Antenna (mounted for vertical polarization).

AA3120 Flat Panel Antenna

Specifications

Frequency range	790 to 960 MHz
Size	88 x 31.5 x 15.1 cm 34 x 12.4 x 5.9 in
Weight	6.0 kg / 13.2 lb
Gain (over dipole)	11 dB
VSWR	<1.3
Impedance	50 ohms
Front-to-Back Ratio	>20 dB
Half-Power Beamwidth	21° E-Plane 71° H-Plane
Connector	Type-N Female
Mounting	To circular support with maximum O.D. of 3.5 in (9 cm)

Function

The AA3120 Flat Panel Antenna is used to broadcast and receive RF signals in the 790-960 MHz radio frequency band.

Features

Ruggedized Design. The AA3120 contains heavy-duty cast aluminum radiators and reflector screen constructed of high strength aluminum alloy sheet. All screws and nuts are stainless steel.

Weatherproof Enclosure. A rugged, impact resistant fiberglass radome provides maximum protection of the AA3120 from harsh environmental conditions.

The fiberglass radome maintains favorable electrical characteristics, even under heaviest icing. The reflector screen eliminates the effect of the mounting structure.

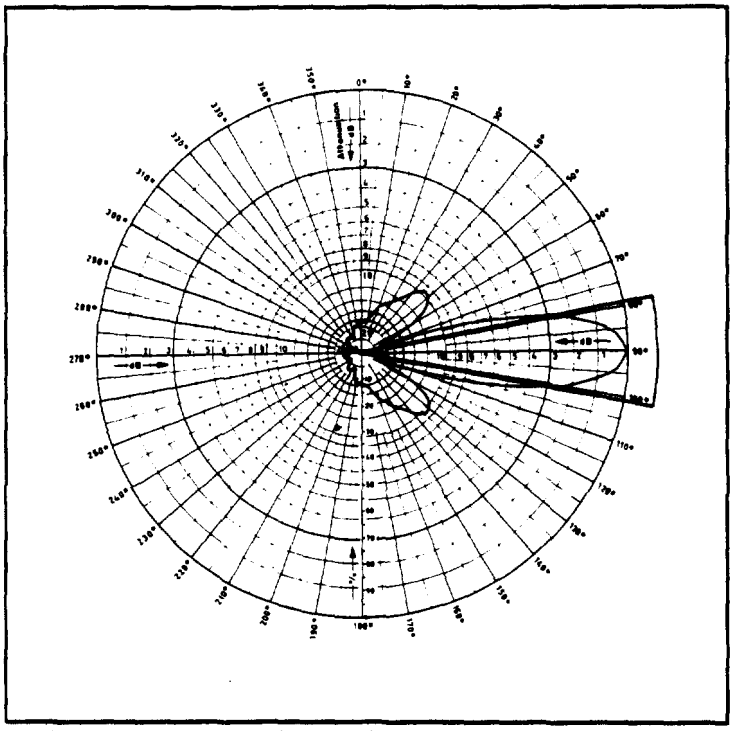
Lightning Protection. The AA3120 Flat Panel Antenna is DC grounded by a cross-section of 0.32 square inches (204 square millimeters) of aluminum.

Low Profile. The Flat Panel's narrow (5.9 inch) depth makes the AA3120 ideally suited to applications requiring a low-profile Antenna.

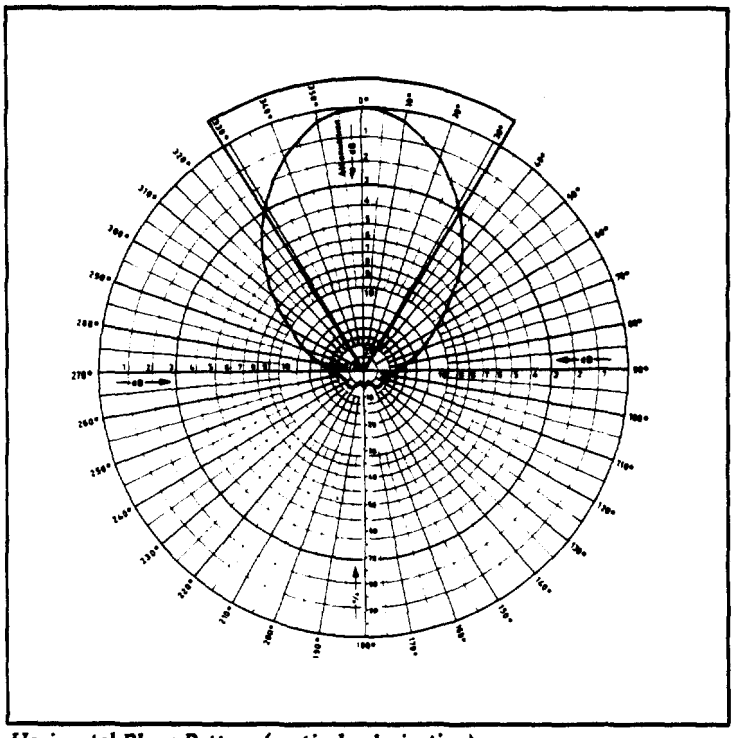
Asymmetrical Pattern. For installations requiring a reading area larger in one dimension than in another, the AA3120 Flat Panel provides a 42° variance in half-power beamwidth from the horizontal to the vertical plane.

AA3120 Flat Panel Antenna

Radiation Patterns



Vertical Plane Pattern (vertical polarization).



Horizontal Plane Pattern (vertical polarization).

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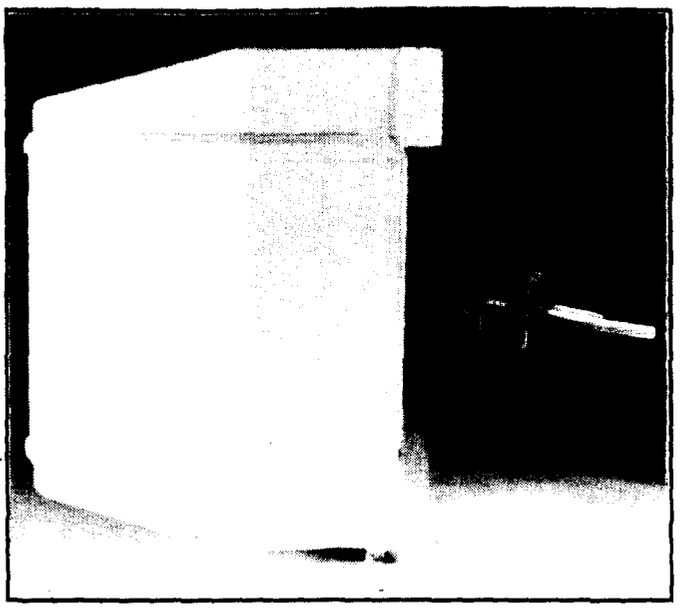
AA3140 PCB Log-Periodic Antenna

Specifications



AA3140 PCB Log-Periodic Antenna with Pole-Mount Clamp (Antenna shown oriented for vertical polarization.)

Frequency range	845 to 950 MHz
Size	26.7 x 6.4 x 26.7 cm 10.5 x 2.5 x 10.5 in
Weight	1.12 kg / 2.5 lb
Gain (over dipole)	6 dB
VSWR	1.5:1
Half-Power Beamwidth	60° E-Plane 90° H-Plane
Connector	Type-N Female
Mounting (Standard)	Pole-Mount Clamp
Mounting (Optional)	Wall Mount

Function

The AA3140 printed circuit board (PCB) log-periodic antenna is used to broadcast and receive RF signals in the 845 to 950 MHz radio frequency band.

The AA3140 is a compact, low gain, wide beamwidth antenna ideal for installations requiring maximum coverage at close range (less than 6 m/20 ft).

Features

Rugged. The AA3140 antenna consists of a printed circuit board with etched elements. All aluminum materials are anodized for maximum reliability and corrosion resistance. Hardware and fastenings are stainless steel.

Mounting Versatility. The AA3140 antenna's heavy aluminum mounting casting allows installation for vertical or horizontal polarization.

Symmetrical Pattern. For installations requiring a relatively symmetrical, three-dimensional reading area, the AA3140 offers a broadcast pattern of similar configuration and dimension in both the horizontal (90°) and vertical (60°) planes.

Weatherproof Enclosure. The AA3140 is enclosed in a low profile weatherproof radome, providing added protection from harsh environmental conditions including snow, ice, and strong winds.

The outer surface of the radome has a slick white gel coat over a special laminated material of polyester resins selected for favorable electrical characteristics and high resistance to ultraviolet radiation.

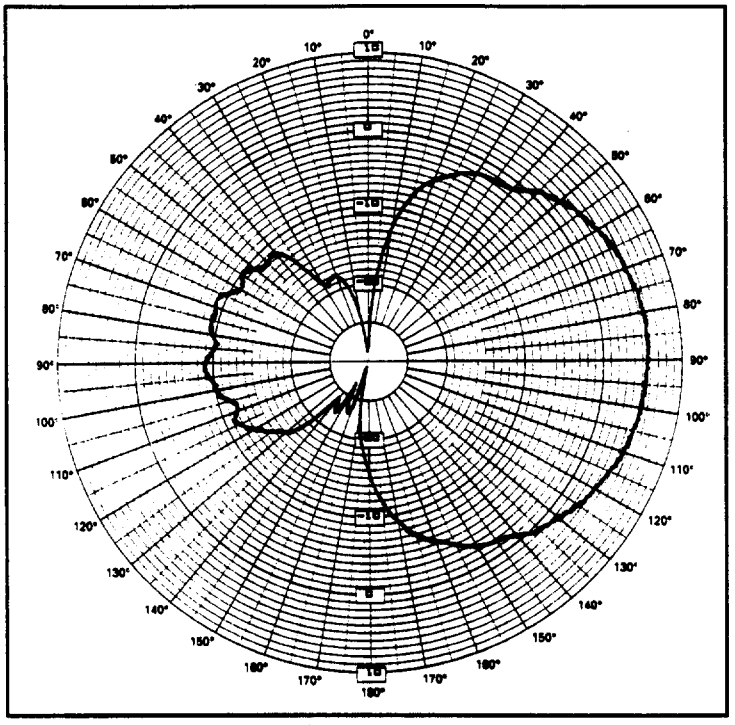
Options

Check Tag Option. The AA3140 PCB log-periodic antenna may be ordered with the AT5720 check tag installed.

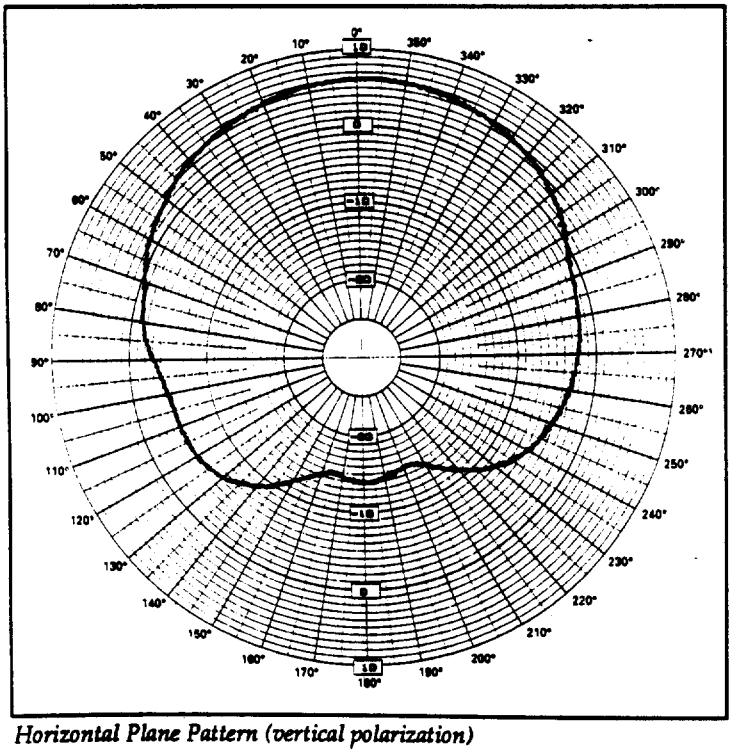
Mounting Options. The AA3140 antenna is available with either a pole mounting clamp or a bulkhead mount. Please specify mounting hardware type when ordering.

AA3140 PCB Log Periodic Antenna

Radiation Patterns



Vertical Plane Pattern (vertical polarization)



Horizontal Plane Pattern (vertical polarization)

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